ABSTRACT

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Title of Diploma Thesis: Multicomponent analysis

This diploma thesis deals with the determination of concentrations of individual dyes in mixtures by multicomponent spectrophotometric analysis.

The method was tested on selected dyes which were divided into two groups. The first group contains methyl orange, methyl red, orange II and phenol red. The second group consists of methylene blue, bromocresol green and thymol blue. Within each group mixtures were prepared containing combinations of two, three and four dyes in various ratio.

Spectra of prepared mixtures were measured by diode array UV/VIS spectrophotometer. Absorbance values were read at wavelengths of absorption maxima of the individual dyes. Using the pseudoinverse matrix, concentration ratios of components were calculated from the absorbance values. The determination in determined and over determined systems was performed.

On the basis of the results obtained by the method of analysis it is possible to determine the individual concentration of the multi-component dyes mixtures without prior separation.

Keywords: spectrophotometry, multicomponent analysis, matrix, dye